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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/527,437

03/11/2005

Go Hanzawa

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12/15/2005

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EXAMINER

PRUCHNIC, STANLEY J

ART UNIT

PAPER NUMBER

2859

DATE MAILED: 12/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/527,437

Applicant(s)

HANZAWA ET AL.

Examiner

Stanley J. Pruchnic, Jr.

Art Unit

2859

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/11/05; 5/31/05 (2 sheets)
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Drawings*

2. The corrected or substitute drawings were received on **11 April 2005**. The examiner has **HAS** approved these drawings.

### *Specification*

3. The abstract of the disclosure is objected to because:
  - it is more than one (1) paragraph; and
  - also, perhaps "read" before "end surface" in the second from last line of the Abstract should be deleted and replaced therefor by --rear-- in order to correct an obvious typographical error.

Correction is required. See MPEP § 608.01(b).

4. The disclosure is objected to because of the following informalities:

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: --TEMPERATURE SENSOR WITH QUICK RESPONSE--.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Appropriate correction is required.

### *Claim Objections*

5. Claims 1 and 2 are objected to because of the following informalities:

- In Claim 1, in Line 11, perhaps the word “a” before the phrase “**front end side**” should be deleted and replaced therefor by the word --the-- in order to more clearly describe the invention, since the cylindrical metal tube has already been described as having “a front end side”, which is “blocked” (in Lines 2-3 of Claim 1).
- In Claim 2, in Line 2, perhaps the word “a” before the phrase “**front end of said thermal sensing portion**” should be deleted and replaced therefor by the word --the-- in order to more clearly describe the invention, since “a front end” of said “**thermal sensing portion**” has already been introduced (in Line 16 of Claim 1).

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase in Claim 1, Lines 2-3, with regard to the cylindrical metal tube “having a front end side blocked”, the grammatical placement of “side” and “blocked” after “a front end” makes the claim language confusing, since it is not clearly indicated which claim element is “blocked”.

The first element, “a cylindrical metal tube extending in an axial direction” may be considered to have a “front end” at an extreme of said axial direction and a “side of the tube” that may be parallel to the axial direction (*i.e.*, defining a cylinder parallel to said axial direction).

But it is not clear, from the claim language, whether “front end” is intended to refer merely to a coordinate location in the axial direction where the metal tube no longer extends or to a physical element that is part of the cylindrical metal tube.

Thus, alternative interpretations for “having a front end side blocked”, as claimed by Applicant in Claim 1 may include:

(a) the "front end side" considered to be a portion of a side of the tube that is located at one extreme (an end of the tube) in the axial direction; or

(b) the "front end side" considered to be a "closed end" of the tube, wherein "side" refers to one or the other directions along the "axial direction".

The specification refers to the "blocking" associated with the tube 3 shaped like a "bottomed pipe", understood from this that the tube end is blocked, *i.e.*, sealed, so the Examiner has considered that Applicant intends that the end of the tube 3 has no openings, and has no openings in a side and has no openings in a front, *i.e.*, this is considered to mean the front end is not open at all (blocked).

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1-11 are rejected under 35 U.S.C. 102(e) as being anticipated by **MURATA *et al.*** (U. S. Patent No. 6,639,505 B2, hereinafter **MURATA'505**).

MURATA'505 discloses a temperature sensor (S1) comprising:

a cylindrical metal tube 2 extending in an axial direction (*i.e.*, in a direction parallel to the wires 6a in the sheath pin 6) and having a front end side blocked ("the front end side"; Col. 5, Lines 1-8; see Fig. 1; considered generally to be the "temperature sensing portion 1"; comprising "metal enclosure 2") -- the term "blocked", as used by Applicant, having been considered to mean the front end is not open at all, as described above in Paragraph 7--;

a thermal sensing element (3, 4) held in an inside ("on the bottom side"; Col. 5, Line 8) of said metal tube 2 and including a thermal sensing portion (thermistor 3) with electrical characteristic varying according to a temperature (Col. 5, Lines 15-20), and a

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pair of electrode wires (4) provided in said thermal sensing portion and extending toward a rear end side (the "open end") of said metal tube 2; and

a sheath member ("sheath pin 6") held in an inside of said metal tube (2) and including a sheath pipe ("outer cylinder 6b"; Col. 5, Lines 45-53) in which a pair of metal cores (6a) connected to said pair of electrode wires (4) of said thermal sensing element are held while electrically insulated, wherein:

said metal tube (2) has a small-diameter portion (2a) located on a front end side (see Figs. 1-2) and entirely having an inner diameter smaller than an outer diameter of said sheath member (6), and a large-diameter (2c) portion located on a rear end side of said small-diameter portion and having a diameter larger than an outer diameter of said small-diameter portion (Fig. 1); and

said thermal sensing portion (3) is held in said small-diameter portion (2a) and an electrically insulating member (glass layer 5 and holder member 7, of alumina as a main component, as claimed by Applicant in Claim 6; Col. 6, Lines 18-26) is filled at least (see Figs. 2, 6 and 15) in between a front end of said thermal sensing portion (3) and a front end of an inner wall of said metal tube (2) as claimed by Applicant in Claim 1 and 6.

Further regarding Claims 2-3, MURATA'505 discloses (Fig. 3; Col. 5, Line 61-Col. 6, Line 7) a range of preferred longest distances, down to zero when D2 (Fig. 3) becomes equal to D4 (Col. 7), and when the front wall is considered to be any part of the inner wall in the front portion of the tube 2a, having diameter D4 (Fig. 2); and regarding Claim 3, the shortest distance between the thermistor and the metal tube satisfies the claimed relation at least when said distance is zero and an outer diameter of tube 2a is not larger than 3.5 mm when D3 may be as low as 0.5 mm.

Further regarding Claim 4, MURATA'505 inherently discloses an average filling rate of said electrically insulating member is not lower than 75%, in the glass portion. Although the ceramic portion(s) may have more porosity, so the filling rate would be lower, and even lower if considered to include the large void portion at the tip, but this portion is not considered included in the insulating member portion, so does not contribute to the filling rate in the region of electrically insulating member (5,7).

Further regarding Claim 5, MURATA'505 inherently discloses a heat conductivity of said electrically insulating member is not lower than 1.2 W/m·K, in order to result in a response time less than 6 seconds (Fig. 5).

Further regarding Claims 7 and 10, MURATA'505 discloses said electrically insulating member (5,7) is filled at least in a whole of a space ranging from a front end of said metal tube to a rear end of said thermal sensing portion; and further regarding Claim 10, an adiabatic member (8) is provided between a rear end of said electrically insulating member and a front end of said sheath pipe (6b).

Further regarding Claims 8, MURATA'505 discloses said electrically insulating member is filled at least in a whole of said small-diameter portion, the whole portion extending to the inner diameter of tube 21.

Further regarding Claim 9, MURATA'505 discloses a rear end of said electrically insulating member 5 (Fig. 2) is located on a front end side viewed from a front end of said sheath pipe.

Further regarding Claim 11, MURATA'505 discloses all regions of said pair of electrode wires (4) located on a rear end side viewed from a rear end of said thermal sensing portion (the rear end of said thermal sensing portion being at insulator 7) are disposed in said large-diameter portion (2b).

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in a form PTO-892 and not mentioned above disclose related temperature measurement devices and methods.

- US 6130598 A (Katsuki; Nobuharu et al.) and US 6899457 B2 (Kurano; Atsushi) disclose reduced diameter probe ends.
- US 6501366 B2 (Takahashi; Sotoo et al.) and US 6264363 B1 (Takahashi; Sotoo et al.) disclosed related filling materials and size dimensions of prior art.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stanley J. Pruchnic, Jr., whose telephone number is

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**(571) 272-2248.** The examiner can normally be reached on weekdays (Monday through Friday), the best hours being from 8:30 AM to 4:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez (Art Unit 2859) can be reached at **(571) 272-2245**. The Central FAX Number for all official USPTO communications is **571-273-8300**.

Any inquiry of a general nature or relating to the status of this application or proceeding may be directed to the official USPTO website at <http://www.uspto.gov/> or you may call the **USPTO Call Center** at **800-786-9199** or 703-308-4357. The Technology Center 2800 Customer Service FAX phone number is (703) 872-9317.

The cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site ([www.uspto.gov](http://www.uspto.gov)), from the Office of Public Records and from commercial sources.

Private PAIR provides external customers Internet-based access to patent application status and history information as well as the ability to view the scanned images of each customer's own application file folder(s).

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12/10/05